CLAIM LISTING

A listing of an entire set of claims 1-20 is submitted herewith per 37 C.F.R. §1.121. This listing of claims 1-20 will replace all prior versions, and listings, of claims in the application.

1.　　(Previously Amended)　An apparatus for navigation in a vessel, comprising:

a catheter having a sensor probe connected thereto, the sensor probe acquiring local images of cross-sections of the vessel at the point where the particular local image is made, the sensor probe being movable along the vessel;

a memory for storing a sequence of the local images that is obtained in the course of the movement of the sensor probe along the vessel;

a data-processing unit that is arranged to sort a further local image of the vessel into the sequence that is stored in the memory, the sorting being based on similarities between the further local image and one or more of the local images of the sequence.

2.　　(Previously Amended)　An apparatus as claimed in claim 1, wherein the sensor probe is an intravascular ultrasound system.

3.　　(Previously Amended)　An apparatus as claimed in claim 1, wherein the sensor probe moves along the vessel at a defined speed.

4.　　(Previously Amended)　An apparatus as claimed in claim 1, further comprising a display for showing a stored sequence of the local images, wherein at least one of a position of the sensor probe and a position of an instrument that is in a known position relative to the sensor probe is indicated on the display.

5.　　(Previously Amended)　A method of navigation in a vessel, comprising:

providing a catheter with a sensor probe;

moving, along the vessel, the sensor probe and acquiring local images of the vessel at the point where the particular local image is made;

storing a sequence of the local images during the movement of the sensor probe;

sorting a further local image, which is made by the sensor probe, into the sequence; and

positioning a medical device coupled to the catheter based at least in part on the sorted further local image.

6. (Previously Amended) A method as claimed in claim 5, wherein the local images are cross-sectional intravascular ultrasound images of the vessel .

7. (Previously Amended) A method as claimed in claim 5, wherein the movement of the sensor probe for acquiring the sequence of local images takes place at a defined speed and the generation of local images takes place at a defined rate.

8. (Previously Amended) A method as claimed in claim 5, wherein the further local image is assigned to one or two adjacent images in the sequence with which the similarity of the further local image is greatest.

9. (Previously Amended) A method as claimed in claim 5, wherein the sorting of the further local image is performed repeatedly for a series of further local images, with the search for a sorted position in the sequence held in store, for an image in this series, beginning in each case at the sorted position of the previous further local image in the series.

10. (Previously Amended) A method as claimed in claim 5, wherein the local images in the sequence are shown on a display in line with their positions along the vessel.

11. (Previously Presented) The method of claim 5, wherein the local images and the further local image are acquired by the sensor probe through performing optical coherence tomography.

12.   (Previously Presented) The apparatus of claim 1, wherein the local images and the further local image are acquired by the sensor probe through performing optical coherence tomography.

13.   (Previously Presented) A method of positioning a medical device in a vessel, comprising:

        providing a catheter with a sensor probe;

        moving the sensor probe along the vessel and acquiring local images of the vessel at the point where the particular local image is made;

        storing a sequence of the local images during the movement of the sensor probe;

        connecting a medical device to the catheter, the medical device and the sensor probe being separated along the catheter at a known distance;

        moving the medical device along the vessel and acquiring a further local image of the vessel at the point where the particular further local image is made;

        sorting the further local image into the sequence based on a similarity between the further local image and one or more of the local images of the sequence; and

        positioning the medical device coupled to the catheter based at least in part on the sorted further local image.

14.   (Previously Presented) The method of claim 13, further comprising moving the sensor probe along the vessel by pulling motion.

15.   (Previously Presented) The method of claim 13, wherein the medical device is a stent.

16.   (Previously Presented) The method of claim 13, further comprising performing geometrical corrections to the local images based on pre-existing images.

17.   (Previously Presented) The method of claim 13, further comprising determining the similarity between the further local image and the one or more of the local images of the sequence based on gray-value registration.

18.   (Previously Presented) The method of claim 13, wherein the local images and the further local image are acquired using ultrasound imaging.

19.   (Previously Presented) The method of claim 13, wherein the local images and the further local image are acquired using optical coherence tomography.

20.   (Previously Presented) The method of claim 13, wherein the local images are obtained by moving the sensor probe at a constant rate and acquiring the local images at a constant rate.